

Notice of Allowability

Application No.

10/812,111

Examiner

Lee Fineman

Applicant(s)

ARMSTRONG ET AL.

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 22 June 2007.
2. ☒ The allowed claim(s) is/are 1-6,8,9,11,13,14,17-19,64 and 67-98.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Steven W. Smyrski on 11 July 2007.

The application has been amended as follows:

The listing of claims below replaces all prior versions of claims in the application.

1. (currently amended) An objective design employed for use in inspecting a specimen, comprising:

a focusing lens group comprising at least one focusing lens configured to receive said light energy and form focused light energy;

a plurality of field lenses oriented to receive focused light energy from said focusing lens group and provide intermediate light energy;

a Mangin mirror arrangement positioned to receive the intermediate light energy from the plurality of field lenses through a back side of the Mangin mirror arrangement and form controlled light energy transmitted from a front side of the Mangin mirror arrangement, said Mangin mirror arrangement comprising at least three axially distributed elements comprising two elements having reflective surfaces; and

an immersion liquid between the Mangin mirror arrangement and the specimen, wherein the third element of the Mangin mirror arrangement is in contact with the immersion liquid;

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wherein all lenses are constructed of a single glass material.

2. (currently amended) The objective design of claim 1, wherein said objective design provides a relative bandwidth in excess of 0.5 in the presence of said light energy.

3. (currently amended) The objective design of claim 1, said Mangin mirror arrangement comprising:

a first lens/mirror element having substantially curved concave surfaces and a second surface reflection; and

a second lens/mirror element having minimally curved surfaces and a second surface reflection.

4. (currently amended) The objective design of claim 3, wherein said objective design is configured to be usable with light energy having a wavelength in the range of approximately 190 to 1000 nanometers

5. (currently amended) The objective design of claim 1, configured to have a numerical aperture in excess of approximately 0.9.

6. (currently amended) The objective design of claim 1, configured to have a numerical aperture in excess of approximately 1.1.

7. (canceled)

8. (currently amended) The objective design of claim 1, wherein each lens in the focusing lens group and the plurality of field lenses each has a diameter of less than approximately 25 millimeters.

9. (currently amended) The objective design of claim 1, wherein ~~all lenses are constructed of a single glass material~~ the immersion liquid comprises one from a group comprising:

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a liquid substance;

a semi-liquid substance;

a viscous substance; and

a partially viscous substance.

10. (canceled)

11. (currently amended) The objective design of claim 9, wherein the single glass material is fused silica.

12. (canceled)

13. (currently amended) The objective design of claim 2, said objective providing bandwidth less than approximately 0.9 with a center wavelength of 633 nm.

14. (currently amended) The objective design of claim 2, wherein bandwidth is less than approximately 0.07 with a center wavelength of 196nm.

15. (canceled)

16. (canceled)

17. (currently amended) The objective design of claim 1, wherein said objective is employed with a microscope having a flange, wherein the flange may be located approximately 45 millimeters from the specimen.

18. (currently amended) The objective design of claim 1, wherein said objective is employed with a microscope having a flange, wherein the flange may be located approximately 100 millimeters from the specimen.

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19. (currently amended) The objective design of claim 1, wherein said focusing lens and field lens forms an intermediate image between said field lens and said Mangin mirror arrangement.

20-63. (canceled)

64. (currently amended) The objective design of claim 1, where the immersion liquid has a refractive index greater than pure water.

65. (canceled)

66. (canceled)

67. (currently amended) An objective design, comprising:

a focusing lens group comprising at least one focusing lens configured to receive light energy and form focused light energy;

a field lens oriented to receive focused light energy from said focusing lens group and provide intermediate light energy;

a Mangin mirror arrangement positioned to receive the intermediate light energy from the field lens through a backside of said Mangin mirror arrangement and form controlled light energy using a front side of said Mangin mirror arrangement, wherein the Mangin mirror arrangement comprises first and second lens/mirror elements each having curved concave surfaces and second surface reflection and a third lens element; and

an immersion liquid between the Mangin mirror arrangement and a specimen, wherein the third lens element is in contact with the immersion liquid.

68. (currently amended) The objective design of claim 67, wherein said objective design provides a relative bandwidth in excess of 0.5 in the presence of said light energy.

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69. (currently amended) The objective design of claim 67, said Mangin mirror arrangement comprising:

the first lens/mirror element having substantially curved concave surfaces and a second surface reflection; and

the second lens/mirror element having minimally curved surfaces and a second surface reflection.

70. (currently amended) The objective design of claim 69, wherein said third lens element has one relatively flat surface in contact with the immersion liquid.

71. (currently amended) The objective design of claim 67, wherein said objective is configured to be used with light energy having a wavelength in the range of approximately 190 to 1000 nanometers.

72. (currently amended) The objective design of claim 67, configured to have a numerical aperture in excess of approximately 1.1.

73. (currently amended) The objective design of claim 67, wherein each lens in the focusing lens group and the field lens each has a diameter of less than approximately 25 millimeters.

74. (currently amended) The objective design of claim 67, wherein all lenses are constructed of a single glass material.

75. (currently amended) An objective design employed for use in inspecting a specimen, comprising:

a focusing lens group ~~configured to receive light energy~~ and comprising at least one focusing lens;

at least one field lens oriented to receive focused light energy from said focusing lens group and provide intermediate light energy;

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a Mangin mirror arrangement positioned to receive the intermediate light energy from the at least one field lens through a back side of the Mangin mirror arrangement and form controlled light energy using a front side of the Mangin mirror arrangement; and

an immersion liquid located between said Mangin mirror arrangement and said specimen;

wherein the Mangin mirror arrangement comprises first and second lens/mirror elements each having curved concave surfaces and second surface reflection and a third lens element, wherein the third lens element is in contact with the immersion liquid.

76. (currently amended) The objective design of claim 75, wherein said objective provides a relative bandwidth in excess of 0.5 in the presence of said light energy, said light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range.

77. (currently amended) The objective design of claim 75, said Mangin mirror arrangement comprising:

first lens/mirror element having substantially curved concave surfaces and second surface reflection; and

second lens/mirror element having minimally curved surfaces and second surface reflection.

78. (currently amended) The objective design of claim 75, wherein said objective is configured to be usable with light energy having a wavelength in the range of approximately 190 to 1000 nanometers.

79. (currently amended) The objective design of claim 75, wherein each lens in the objective design has a diameter of less than approximately 25 millimeters.

80. (currently amended) The objective design of claim 75 where the numerical aperture is greater than approximately 0.9.

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81. (currently amended) The objective design of claim 75, where the numerical aperture is greater than approximately 1.1.

82. (currently amended) The objective design of claim 75, wherein all lenses in the objective are constructed of a single glass material.

83. (currently amended) The objective design of claim 82, wherein the single glass material is fused silica.

84. (currently amended) The objective design of claim 75, wherein corrected bandwidth for the objective is less than approximately 0.9 with a center wavelength of approximately 633 nm.

85. (currently amended) The objective design of claim 75, wherein corrected bandwidth is less than approximately 0.07 with a center wavelength of approximately 196 nm.

86. (currently amended) The objective design of claim 75, wherein said objective may be located in a flange within a microscope, said flange positioned no more than approximately 45 millimeters from the specimen during normal operation.

87. (currently amended) The objective design of claim 75, wherein said objective may be located in a flange within a microscope, said flange positioned no more than approximately 100 millimeters from the specimen during normal operation.

88. (currently amended) The objective design of claim 75, wherein the immersion liquid is primarily water.

89. (currently amended) The objective design of claim 75, wherein the immersion liquid is primarily oil.

90. (currently amended) The objective design of claim 75, wherein the immersion liquid is primarily silicone gel.

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91. (currently amended) The objective design of claim 75, wherein the objective design is optimized to produce relatively minimal spherical aberration, axial color, and chromatic variation of aberrations.

92. (currently amended) The objective design of claim 75, said objective design having a numerical aperture of greater than approximately 1.0 at the specimen.

93. (currently amended) The objective design of claim 75, wherein each lens in the objective design has a diameter of less than approximately 35 millimeters.

94. (currently amended) The objective design of claim 75, said objective design having an ability to be employed with a microscope having a flange, wherein the flange may be located less than no more than approximately 45 millimeters from the specimen during normal operation.

95. (currently amended) The objective design of claim 75, said objective design employing no more than two glass materials.

96. (currently amended) The objective design of claim 95, wherein the no more than two glass materials comprise fused silica and calcium fluoride.

97. (currently amended) The objective design of claim 75, wherein the immersion liquid comprises one from a group comprising water, oil, and silicone gel.

98. (previously presented) The objective design of claim 75, where the immersion liquid has a refractive index greater than pure water.

Allowable Subject Matter

2. Claims 1-6, 8-9, 11, 13-14, 17-19, 64, and 67-98 are allowed.

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3. The following is an examiner's statement of reasons for allowance:

Claims 1-6, 8-9, 11, 13-14, 17-19, 64, and 67-98 are allowable over the prior art for at least the reasons set forth in the office action mailed 20 February 2007.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 5:00.

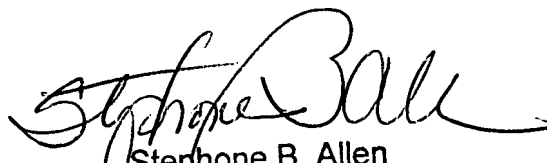
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



LAF
17 July 2007



Stephone B. Allen
Supervisory Patent Examiner